

REMARKS

I. Status of the Claims

Entry of the amended claims presented herein, as well as reconsideration and allowance of all pending claims are respectfully requested. Upon entry of the foregoing amendment, claims 1-19 are pending in the application, with claims 18 and 19 having been added herein and claims 9 and 15-17 having been withdrawn. Claims 1, 3, 7, 11-15, and 17 have been amended herein.

Support for the new and amended claims may be found throughout the original specification and claims. For instance, support for amended claim 6 is found in the second paragraph beginning on page 4. Support for amended claims 11-13 and 15 is found in the first paragraph beginning on page 8. Support for amended claims 1, 3, 7, 14, and 17, and new claims 18 and 19 is found in figures 1 and 3. Support for new claim 19 is found in the first paragraph on page 4.

II. Restriction

The Office Action recited the restriction requirement as set forth by the Examiner in a telephone conference with the undersigned on August 9, 2005. The applicants have elected Group I, including claims 1-8 and 10-14. Contrary to the statement made in the Office Action, the election was made without traverse. Claims 9 and 15-17 have been withdrawn herein.

III. Objection to the Specification

A. Form of the Specification

The Office Action objected to the layout of the specification and suggests that the specification be amended to follow the recommendations of 37 C.F.R. § 1.77(b). Applicants have submitted a substitute specification that more closely follows the recommendations of the Regulations. The objection to the specification is moot and should be withdrawn.

B. Antecedent Basis

The Office Action also objected to the specification for allegedly failing to provide proper antecedent basis for the claimed subject matter. In particular, the Office Action objected to the use of "binder" in claims 11-13 and the use of "suitable binding agent" in the specification.

Applicants respectfully direct the Examiner's attention to Example 2, which demonstrates the interchangeability of these terms through use of both "suitable binding agent" and "suitable binder." (Page 13, 4th paragraph). Furthermore, one skilled in the art would recognize the interchangeability of the terms. To facilitate further prosecution, applicants have revised the specification and claims to uniformly use "binding agent" in place of "binder" and "binding material." Applicants respectfully request that the rejection be withdrawn.

IV. Claim Rejections - 35 U.S.C. § 112

A. Claims 11 and 12

The Office Action rejected claims 11 and 12 for allegedly failing to comply with the enablement requirement of 35 U.S.C. § 112. In particular, the Office Action questioned how to obtain different concentrations of binding agent in the resin transport framework. The Office Action also questioned which binding agent was used in the various examples of the invention.

Applicants respectfully traverse. Binding agent concentrations are described in weight percentages in Example 1 (Page 11, 4th paragraph) and Example 2 (Page 13, 4th paragraph). This is sufficient for one skilled in the art, with the benefit of the specification, to obtain different concentrations of binding agent in the resin transport framework.

The specification gives numerous examples of suitable binding agents, as set forth in the first paragraph beginning on page 8: "The binding agent can be low-density polyethylene or their

mixture, natural rubber, butyl or Nitrile rubber or combinations. However best results are obtained with Nitrile rubber for both the forms of media."

In light of the highlighted portions in the specification and the amendments to the claims, applicants respectfully submit that the rejections based on 35 U.S.C. § 112 have been traversed. Claims 11 and 12 should be allowed.

B. Claims 1, 6, 10, and 14

The Office Action rejected claims 1, 6, 10, and 14 under 35 U.S.C. § 112, second paragraph, for alleged indefiniteness for failing to particularly point out and distinctly claim the subject matter that applicants regard as the invention. The Office Action's rejection related to use of the word "substantially" in those claims.

"Substantially" no longer appears in claim 6. The rejection is moot with respect to that claim, and it should be withdrawn.

The use of "substantially" in claims 1, 10, and 14 is supported by the fourth and fifth paragraphs beginning on the third page, as well as the second through fifth paragraphs beginning on page 4. In particular, "the media can get wet and still maintain a highly conductive ion transport environment." (Page 4, 3rd paragraph). Furthermore, media is described as "in a uniformly porous form as possible so that the water flow is possible with maximum flux." (Page 3, 4th). One skilled in the art would, with the benefit of this disclosure, understand the use of "substantially" in claims 1, 10, and 14. The rejection has been traversed, and it should be withdrawn.

V. Claim Rejections – 35 U.S.C. §§ 102 and 103

A. U.S. Patent No. 6,379,518, to Osawa, *et al.*

Claims 1-8, 10, and 14 were rejected as allegedly anticipated by, or, in the alternative, obvious in light of, U.S. Patent No. 6,379,518, to Osawa, *et al.* (hereinafter "Osawa"). The Office Action contended, "Osawa discloses the electrodeionization apparatus, which has a plurality of cation exchange membranes and plurality of anion exchange membranes alternately arranged between electrodes in such a manner as to alternately form diluting compartments and concentrating compartments." The Office Action admitted, however, that Osawa is "silent" about "a substantially nonporous resin transport framework."

Osawa neither anticipates nor renders obvious any of the claims of the application. It is well-established that for a reference to anticipate the claims of an application, that reference must contain all of the limitations of the claim, either explicitly or inherently. Similarly, for a claim to be obvious in light of a reference or combination of references, all of the elements of the claim must be contained in or suggested by the reference or combination of references.

Most significantly, in Osawa the resin beads in the flow path(s) are in direct contact with at least one ion exchange membrane. In the claims of this application, that is not the case. The resin in the flow path does not contact a membrane. Instead, it is encompassed in the framework.

Osawa neither discloses nor suggests the composition of any framework that it may include. To the extent that the Office Action assumed that the composition of the framework was inherent, it did so only with the benefit of the teachings of the instant application. Such hindsight is clearly inappropriate. Claim 1 of the application includes a "substantially nonporous resin framework." Osawa does not teach whether the resin framework (if Osawa can be said to have a framework, or a resin framework, at all) is nonporous. Based on Osawa's disclosure, any

framework that it has could be porous; because there is no way to tell, Osawa neither anticipates nor renders obvious claim 14, claim 1 or those claims that depend from claim 1.

Osawa fails to include additional limitations of those claims that depend from claim 1. For example, claim 2 of the application includes the limitation that "each of said cation exchange zones and said anion exchange zones being in contact with said transport framework." This direct contact is markedly different from any apparatus reported by Osawa, which reports only resin-membrane contact. These membrane-media interfaces would be inefficient due to boundary line water by-passing. One beneficial technical effect of the media as claimed in the instant application (particularly claim 2) is the elimination of water splitting and boundary line by-passing that results from resin-membrane bipolar areas, since bipolar surfaces are between resin and resin. The framework in the instant application is different from the flow path due to the particle size and binder composition, both of which make it soft, smooth and compact. Because of this the framework does not allow boundary line water bypassing. A continuous contact and smooth surface adds efficiency of ion transfer to reject compartment from dilute compartment, which would be inefficient or less efficient if there were gaps between membrane and media. (See paragraphs [0022], [0023], and [0024] of the instant application.) Osawa has not differentiated the composition.

In claims 6 of the application, the average particle size of the resin comprising the resin transport framework is smaller than the average particle size of the resin within the flow path. Osawa makes no mention whatsoever of any particle size differential, and the Office Action did not include any way that this differential may be determined.

Osawa also fails to anticipate or render obvious new claim 18. Osawa does not report any framework appearing on either side of the media. Furthermore, Osawa fails to render obvious or

anticipate new claims 19 and 20. Osawa does not provide fixed flow lengths within the stack as stated in 20; instead, the flow lengths of Osawa appear random. Furthermore, Osawa's structure appears to attempt to minimize pressure drops by altering structure shapes, rather than preventing the structure from interfering in the flow path.

For the reasons given for claim 1, and for the specific reasons given for each of the various dependent claims, Osawa fails to include necessary claim limitations. Therefore, Osawa neither anticipates nor renders obvious any of the claims of the application. The rejection should be withdrawn and the claims allowed.

B. Osawa in view of U.S. Patent No. 5,015,344, to Nidola, *et al.*

The office action rejected claims 11-13 under 35 U.S.C. § 103 as allegedly obvious based on Osawa in view of U.S. Patent No. 5,015,344, to Nidola, *et al.* (hereinafter "Nidola"). The rejection is improper and should be withdrawn. As discussed above, in section V(A), Osawa does not render any claims of the application obvious, because Osawa does not include all of the limitations of claim 1. Osawa therefore also fails to render obvious claims 11-13, which depend from claim 1.

Nidola fails to supply the missing limitation(s) necessary for Osawa to render the claims obvious. Furthermore, even if it did include those limitation(s), there is no motivation to combine Osawa with Nidola. It is well-established that for two references to be combined in an obviousness rejection, there must be motivation to combine those references that appears within those references themselves. The motivation can not be provided by the very application that contains the claims that are rejected.

One skilled in the water purification art would not have been motivated to combine Osawa with Nidola. Nidola involves coating an electrode, something that is entirely different

from the electrodeionization process. One skilled in the art would have no motivation whatsoever to combine the electrodeionization media of Osawa with the electrode coating in Nidola. Because Nidola is nonanalogous art, and because, in any event, the combination of Nidola and Osawa does not include all of the limitations of the claims, the rejection has been traversed. The rejection should be withdrawn and the claims allowed.

CONCLUSION

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and as such, the present application is in condition for allowance. If the Examiner believes for any reason that personal communication will expedite prosecution of this application, he is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Response is respectfully requested.

Respectfully submitted,



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